Forster Bowling Club: A Cost-Efficient Commercial Installation

▸ NSW, Australia

▸ 100kW

solarpv Commercial

Forster Bowling Club's 100 kW system optimized by SolarEdge power optimizers and SolarEdge inverters for increased energy, maximum design flexibility, enhanced maintenance, and best-in-class safety.

Modules:	400 Trina TSM-250PC05A
Power optimizers:	200 x OP600 SolarEdge
Inverters:	6 x SE17Kw SolarEdge
Installer:	SolarPV Commercial

"Not only did the SolarEdge DC optimised inverter system make us more efficient by simplifying our site design and installation process while significantly decreasing the system owner's upfront BoS costs, but it outperformed our energy estimates by more than 6% in the first year of production."

> Daniel Chapman, Chief Commercial Officer, Solar PV Commercial

Since 2009, 'Solar PV Commercial' company has completed more than 4,000 PV installations in Australia and specializes in providing 50-250kW PV solutions tailored to the energy requirements of business owners in NSW, and around Australia.

In 2014, the company installed a PV system at the popular Forster Bowling Club. This site has East-to-West roofing with peak usage hours in the afternoon. Requiring opposite-facing module orientations and spanning a large space, this site could have proven to be both a costly and complicated installation.

During the site design process, Solar PV Commercial was introduced to the SolarEdge DC optimised inverter system, which simplifies site design and increases energy, while maintaining cost effectiveness.

Faster and Easier Site Design and Installation: 12 strings versus 20 strings with traditional inverters

The SolarEdge DC optimised inverter solution allows for both longer strings and multiple orientations, tilts, and even module types in the same string. "The SolarEdge technology simplified site design for us by providing unprecedented design flexibility," stated Daniel Chapman, Chief Commercial Officer, Solar PV Commercial.

When the site was initially designed with a standard string inverter, there was a need for 20 strings of 20 modules. But with the SolarEdge DC optimised inverter solution, the site required only 8 strings of 34 modules and 4 strings of 32 modules. This 40% reduction in strings, leads to decreased BoS costs for wiring, combiner boxes, and fuses.
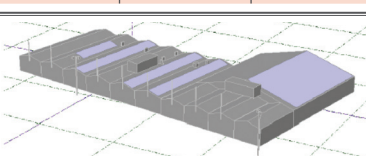

Traditional system   **SolarEdge system**
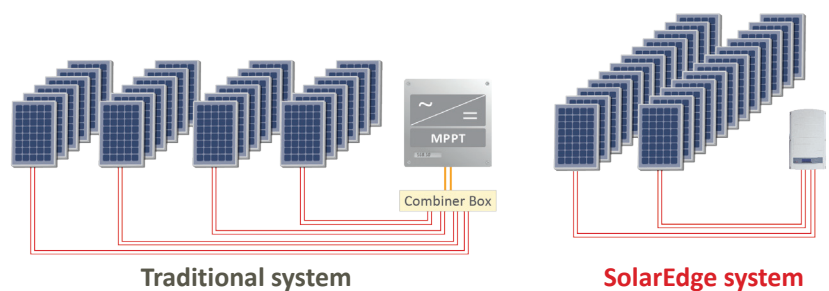
> "Not only did SolarEdge technology increase the site's lifetime energy production by 7.7% and significantly decrease our customer's upfront BoS costs, but it also made us more efficient by simplifying our site design and installation process," stated Mr. Chapman.

Increased Energy Yield with Module Level MPPT: Outperforming Energy Estimates

Besides increasing design flexibility, the SolarEdge DC optimised inverter system increases energy production as it provides per module maximum power point tracking (MPPT) and therefore allows each module to generate its own maximum possible energy. This eliminates power losses due to module mismatch caused by a variety of sources, including module orientation, thermal mismatch, soiling, uneven aging, and partial shading.

During the planning of the site, a PVSyst simulation was conducted which estimated production of the SolarEdge inverter at 145.1 MWh/yr versus a standard string inverter at 136.7 MWh/yr. While the installer, based on his experience, felt this estimate was low and predicted SolarEdge to perform at 160 MWh/yr even he was surprised by the system's actual performance.

|		Traditional String Inverter	solaredge	Advantage, year 1	Advantage, year 20	Cumulative advantage over 20 years
PVsyst Yield Forecast*	Annual AC Energy	136.7 MWh/yr	145.1 MWh/yr	6.2%	9.6%	7.7%
	Performance Ratio	77.9%	82.7%			
	Shading Loss	6.6%	2.7%			
PVsyst Design	Inverters	4	6			
	Modules Per String	20 strings of 20 modules	8 strings of 34 modules 4 strings of 32 modules			

* Shading loss, PR and annual AC energy production are calculated by Pvsyst

Following a year of production, the SolarEdge system outperformed the PVSyst estimate and the installer's estimate by reaching 170 MWh/yr. This was an increase of 6.25% over the estimate that the installer provided the system owner and 17% over the PVSyst. As of January 2015, the lifetime revenue of the system reached $46,885.29 AUD, which decreased the payback period by 4 months from the installer's estimates.

Enhanced Safety

With a unique built-in safety feature, The SolarEdge DC optimised inverter system provides ultimate safety for installers, maintenance personnel, firefighters, and other emergency forces by eliminating the risk of electrocution and electric arcs. In case of inverter or grid shutdown, SolarEdge's proprietary SafeDC™ technology acts as a certified DC disconnect which automatically removes DC current as well as voltage from all string wires. The voltage of each module is reduced to 1V.
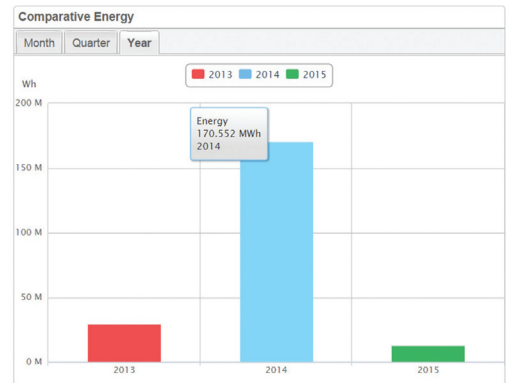
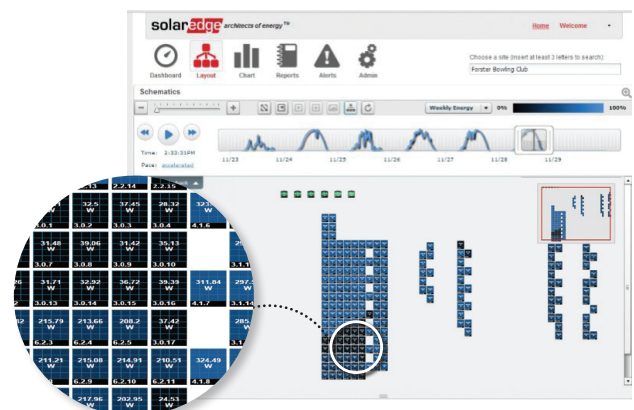Screenshot from SolarEdge monitoring portal showing annual energy production

> **"Standing behind every product we install, it is important to us that we deliver high-quality, superior systems. Safety is a key feature in any PV system for both our customers and our employees. In my opinion, the DC disconnect in SolarEdge technology puts its products in a superior safety class,"** stated Mr. Chapman.

Using SolarEdge technology helped Solar PV Commercial develop and install a system that provided better ROI for its customer and improved its service offering and efficiency. "With our overlying mantra being to keep the process of going solar as simple as possible and ensure that the customer understands the result the solar system will have on their energy bills, SolarEdge technology is a perfect match for us," stated Mr. Chapman.

Cost Effective Maintenance

The SolarEdge DC optimised inverter sytem enables module, string, and system-level performance monitoring and offers accurate troubleshooting pinpointed on a virtual site map for enhanced maintenance, improved transparency into system performance, and increased system uptime.

> **"For the Forster Bowling Club, module-level monitoring means there is transparency into the system's energy output which can be displayed in its lobby for visitors to see. For us, this means that when the site has decreased energy output, we do not waste hours troubleshooting to locate the cause. Not only does SolarEdge technology make the PV system more efficient, it also makes us more efficient!"** stated Mr. Chapman.

The chart view from the SolarEdge monitoring portal shows the performance of individual modules. This graph illustrates the power of each module is optimal and independent of other modules.